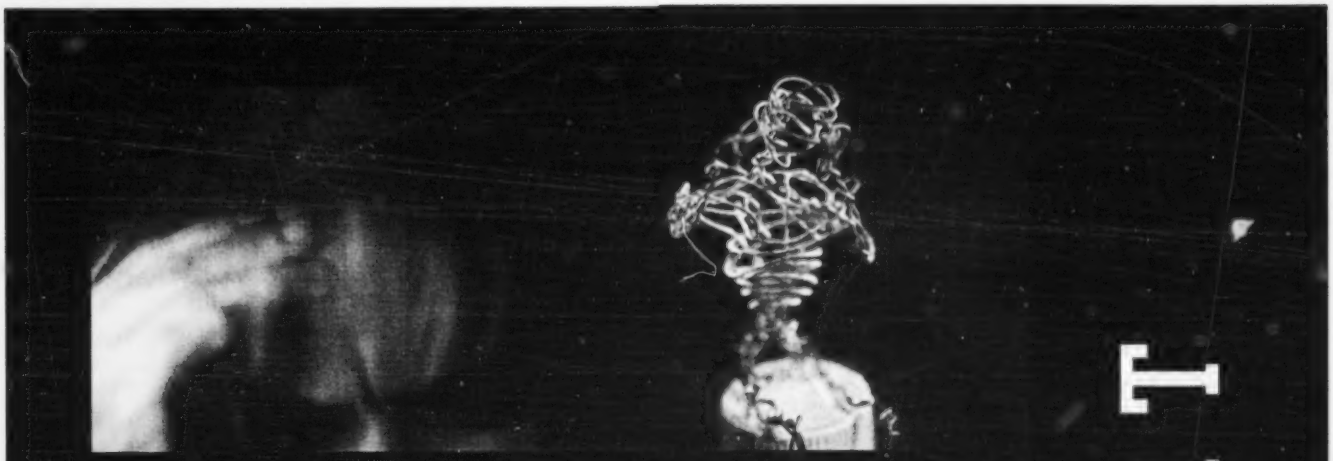
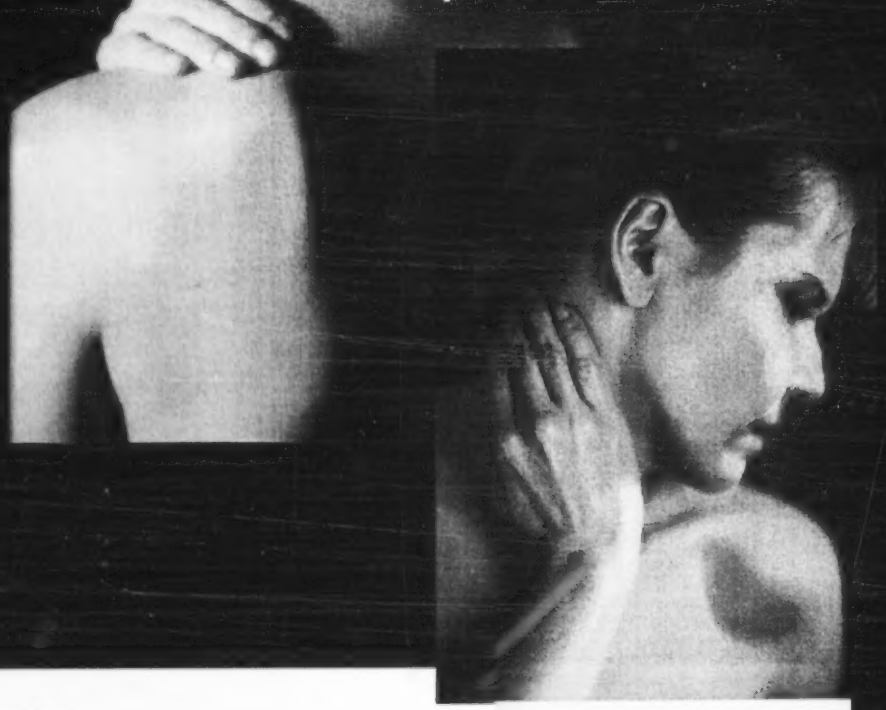


Chronic Pain in Alberta: A portrait from the 1996 National Population Health Survey and the 2001 Canadian Community Health Survey

REPORT



Alberta
HEALTH AND WELLNESS

Health Surveillance

May 2003

104-05784/

Chronic Pain in Alberta: A portrait from the 1996 National Population Health Survey and the 2001 Canadian Community Health Survey

Health Surveillance
Alberta Health
Edmonton, Alberta

May, 2003

Alberta
HEALTH AND WELLNESS

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ISBN (0-7785-2404-3)

Executive Summary

The 1996 National Population Health Survey (NPHS) asks respondents about pain intensity and interference with activity due to pain. The answers provide an estimate of the prevalence of chronic pain among Albertans. While 11.2 per cent report some chronic pain, about 2.3 per cent characterize their chronic pain as severe.

The proportion of individuals suffering chronic pain increases with age and decreases as income increases, but does not differ by place of residence. As self-reported pain levels increase, health status decreases and self-reported use of public health care services increases.

Measures of actual health care utilization were derived from linked administrative records. These confirm that as reported pain levels increase, use of public health care services increases. These data also show that this relationship existed for at least four years prior to time of the survey, and for at least one year after the survey was conducted.

Finally, the number of individuals suffering chronic pain is projected to increase dramatically in Alberta over the coming decades due to the aging of the population, even if the prevalence of chronic pain does not change.

Acknowledgments

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Introduction

Chronic and severe chronic pain

Chronic pain is defined by the International Association for the Study of Pain (1986) as an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage that persists beyond the expected time frame for healing, or that occurs in disease processes in which healing may never occur. A recent systematic review (Ospina & Harstall, 2003) concludes that standardized definitions and criteria to define "chronic" or "severe" pain are not available and diverse pain qualifiers have been proposed. It is clear, however, that in severely affected individuals, chronic pain is associated with considerable suffering, disability, and high levels of utilization of health care services over long time spans. The prevalence of chronic pain in Alberta is not known, but the review (Ospina & Harstall 2003) of prevalence studies carried out in other jurisdictions suggest a prevalence of severe chronic pain in the range of 8 per cent (in children) to 15 per cent (in a clinical elderly population).

Prevalence

Unfortunately, administrative data sources are unable to provide sound estimates of the prevalence of chronic pain because the International Classification of Diseases 9th Revision (ICD-9-CM) diagnostic system is not organized by symptoms such as pain. Furthermore, chronic pain can be a symptom of a large number of specific diseases (such as arthritis, diabetes, heart disease and endometriosis and hundreds more). As a result, the prevalence of chronic pain is typically estimated from health surveys. Millar (1996) presents a portrait of chronic pain in Canada based upon responses to the 1994 National Population Health Survey. The current report updates this information for Albertans from the 1996 National Population Health Survey. It also presents information about health utilization from administrative records linked to responses from the National Population Health Survey.

Data Sources

National Population Health Survey

The National Population Health Survey (NPHS) is a major longitudinal health survey conducted by Statistics Canada with the support of Health Canada and the provincial health ministries. In 1996, Alberta Health and Wellness commissioned survey responses from an additional cross-sectional sample of individuals in order to examine health status across the province's 17 health regions.

The NPHS is comprehensive in scope, and includes questions relevant to an examination of the prevalence of chronic pain and the characteristics of chronic pain sufferers.

The Health Utility Index

Specifically, the NPHS includes a set of survey questions utilized to derive the Health Utility Index (HUI). The HUI is a single value from 0 to 1 for each individual surveyed representing the degree of health functioning that the individual enjoys. (See Wolfson (1993) for a discussion of the HUI including references that describe its development.)

Two questions measure pain states and are included in the calculation of the HUI. In addition, a wide variety of questions about health status and health care utilization are also asked on the NPHS. This provides the opportunity to explore the impact of chronic pain on sufferers.

Record linkage

Comparing survey results with administrative records can help to characterize how individuals who suffer from chronic pain use public health care services. An important feature of the NPHS survey was that individuals were asked to allow provincial ministries to link their survey responses to administrative records, and were invited to provide their health care identification numbers to allow this linkage to occur.

For those individuals who consented, the Physician Services and the Hospital Morbidity files of the Alberta Health Care Insurance Plan were linked to the NPHS survey responses.

The current report presents findings from the NPHS and the linked Alberta Health and Wellness administrative records to characterize the population suffering chronic pain in Alberta.

The National Population Health Survey Pain Questions

Prelude (presented at the beginning of the HUI questions):
The next set of questions asks about your day-to-day health. The questions are not about illnesses like colds that affect people for short periods of time. They are concerned with a person's usual abilities.

Are you *usually* free of pain and discomfort?

1. Yes (skip to next section)
2. No

How would you describe the *usual* intensity of your pain or discomfort?

1. Mild
2. Moderate
3. Severe

How many activities does your pain or discomfort prevent?

1. None
2. A few
3. Some
4. Most.

These questions are re-coded into the following indices for the calculation of the HUI.

HSC6DPAD (Derived activities prevented-due to pain/discomfort)

Value	Label
1	NO PAIN/DISCOMFORT
2	DOESN'T PREV ACTIVITIES
3	PREVENTS FEW ACTIVITIES
4	PREVENTS SOME ACTIVITIES
5	PREVENTS MOST ACTIVITIES

HSC6DSEV (Derived severity of pain)

Value	Label
1	NO PAIN/DISCOMFORT
2	MILD PAIN/DISCOMFORT
3	MOD PAIN/DISCOMFORT
4	SEVERE PAIN/DISCOMFORT

Subjects

The population under study was Albertans aged 12 and over (or aged four to 11 as reported by a parent or proxy). The total sample size was 15,535. Analyses employed a relative weight derived from the sampling procedure.

Linkage between NPHS responses and Alberta Health and Wellness administrative databases was successful for 6,012 individuals. This relatively low rate is sufficient to cast doubt on the generalizablility of the results[1]. However, the uniqueness of the data and the strength of the findings dictated that the results be presented here.

1 No child less than age 12 was asked for linkage information. Among those aged 12 or over, those less than 40 were less likely and those over 60 more likely to supply linkage information. In addition, those resident in Edmonton or Calgary were more likely to supply linkage information. The groups did not differ according to levels of reported pain, although individuals who supplied linkage information reported more disability days and medical consultations.

Results

Prevalence by Pain Classification

Using the NPHS weights derived from the 1996 Census Populations, the number of individuals over age four in Alberta suffering from various pain complaints in 1996 can be estimated.

Table 1 Estimated population by pain categories

	Severity				
	No Pain	Mild	Moderate	Severe	
Activity					Total
No Pain	2,284,477				2,287,447 88.8%
Doesn't Prevent Activities		40,248	27,648	**2,941**	70,836 2.8%
Prevents Few Activities		33,756	**47,181**	**3,460**	84,396 3.3%
Prevents Some Activities		**16,337**	**52,511**		78,356 3.0%
Prevents Most Activities		**4,498**		**22,151**	53,600 2.1%
Total	2,287,447 88.8%	94,838 3.7%	15,4291 6.0%	38,059 1.5%	2,571,666 100%

Red indicates severe chronic pain, orange indicates moderate chronic pain, and yellow indicates mild to moderate chronic pain.

Table 1 presents this data as a cross tabulation between the pain severity and the activity limitation by pain questions. The numbers in the cross tabulation table are an estimate of the number of Albertans in each pain category.

As is evident from the table, there is a strong positive association between the two pain questions. This is reflected in the table by the fact that the vast majority of individuals have similar elevations on the two dimensions. As a result, entries in table 1 are presented against four background colours to distinguish four levels of chronic pain: mild, mild to moderate, moderate, and severe. The severe chronic pain category is indicated in red and includes individuals with severe pain and limitations in some or most activities as well as individuals with moderate pain intensity and limitations in most activities. Further analysis was conducted according to this derived pain classification.

Results

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Prevents Most Activities		4,498	**26,952**	**22,151**	53,600
					2.1%
Total	2,287,447	94,838	154,291	38,059	2,571,666
	88.8%	3.7%	6.0%	1.5%	100%

(Bold indicates severe chronic pain. Cells to indicate moderate chronic pain and grey indicates mild to moderate chronic pain.)

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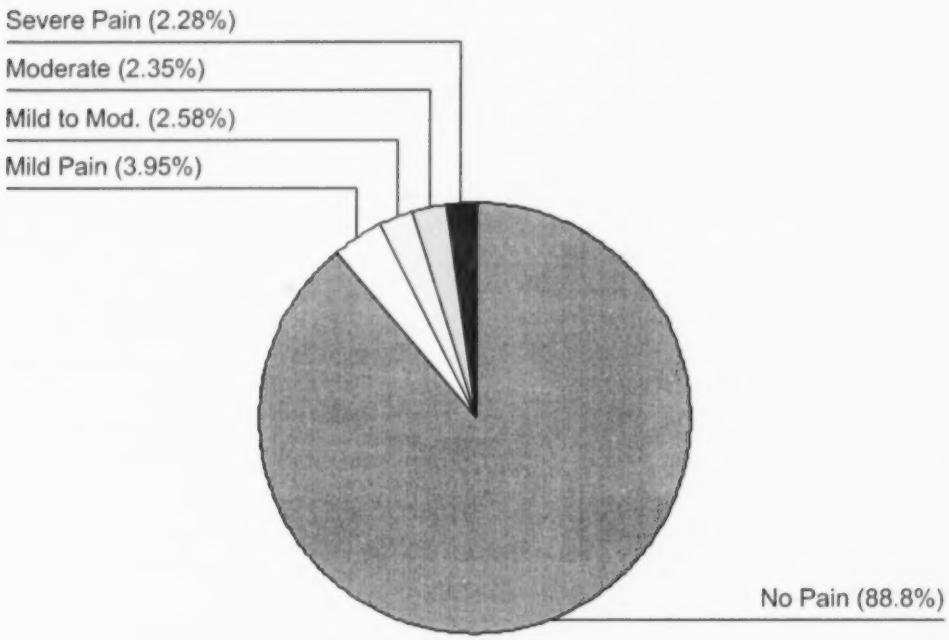
Figure 1 shows the population proportions according to the four derived levels of chronic pain.

Figure 1 Proportion of Albertans age four and over by chronic pain category, 1996



Based on the 1996 Alberta population of 2,571,666, the number of Albertans with severe chronic pain is 58,611. Thus, the estimated prevalence of severe chronic pain in the Alberta population based on the NPHS is 2.3 per cent. The estimated total prevalence of chronic pain, including those who are mildly or moderately affected along with severely affected individuals, is 11.2 per cent.

Age-sex prevalence

Age prevalences were calculated for each sex separately for the derived pain classification using the NPHS weighted data. The data were smoothed prior to further analysis[2].

[2] Smoothing across age within category was accomplished by a localized regression procedure (loess). After smoothing, the estimates were standardized to total 1.0.

Figures 2 and 3 present the age-specific prevalences as stacked area charts. It is clear that the prevalence of pain increases markedly with age, and that females are more likely to suffer chronic pain than are males at every age.

Figure 2 Pain categories by age for males

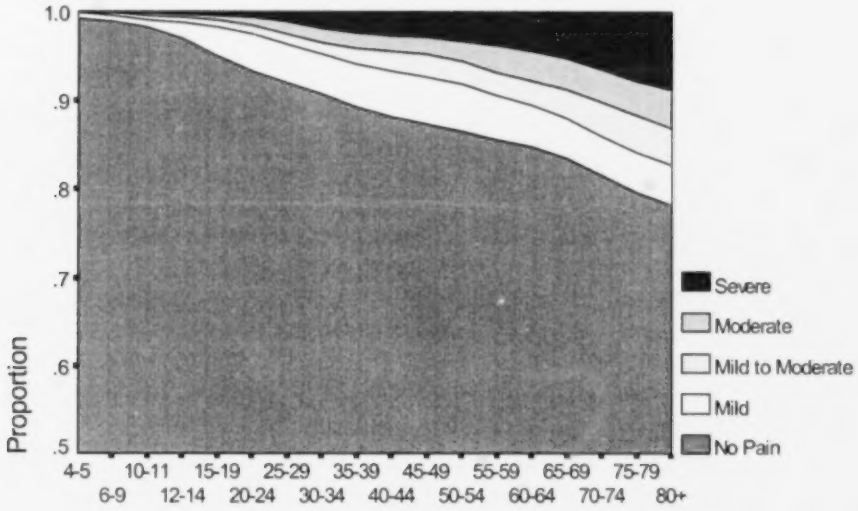
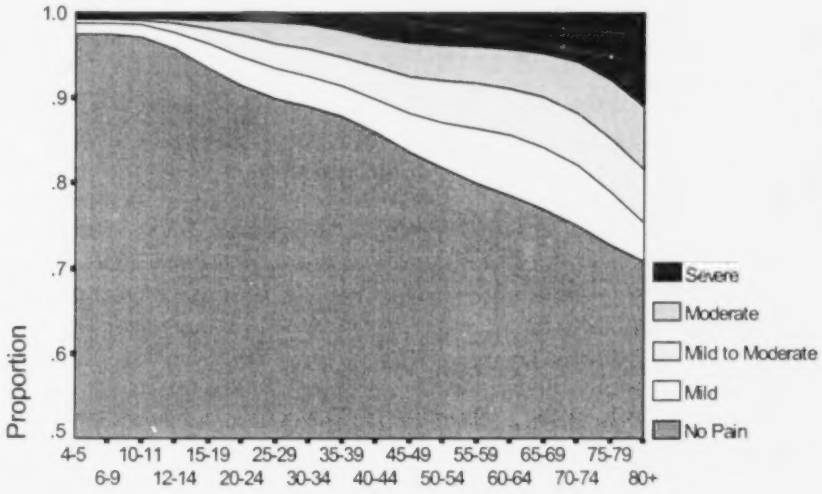


Figure 3 Pain categories by age for females

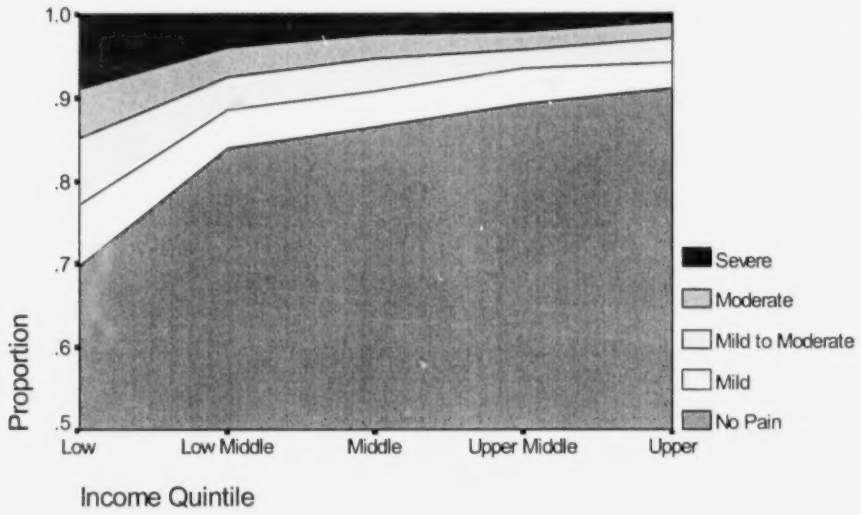


Prevalence by urban-rural residence and by income level

Prevalences were calculated for place of residence. There were no differences between urban and rural residents.

Prevalences were also calculated for each of the five self-reported family income quintiles using the NPHS weighted data. Figure 4 presents the income-specific prevalences as stacked area charts. It is clear from this figure that the prevalence of chronic pain decreases markedly as income increases.

Figure 4 Pain classification by income quintile



Health status by pain classification

In this section a number of health status variables are presented according to the pain classification presented in the previous section. All variables were measured by the NPHS. The fundamental finding is that all of these variables show a gradation with levels of chronic pain.

Table 2 Percentage of each pain group in each self-reported health group

	Pain Classification				
Self Reported Health	No Pain	Mild	Mild to Moderate	Moderate	Severe
Excellent	32.9	13.3	4.7	4.0	3.0
Very Good	38.9	31.2	23.8	11.8	10.1
Good	23.5	37.5	37.9	32.0	19.9
Fair	3.9	16.2	25.6	39.3	31.9
Poor	0.7	1.8	8.0	12.9	35.2

The Distress scale is the sum of six items from the Composite International Diagnostic Interview (CIDI Scores range from 0 to 24 with higher scores indicating more distress.

Table 3 Distress scale score by pain group

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Distress Scale	2.26	3.46	3.74	4.53	6.45

The probability of being diagnosed as a case of clinical Depression in an examination by a psychiatrist is also derived from items from the CIDI.

Table 4 Probability of suffering clinical depression by pain group

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Probability of Depression	.04	.11	.14	.16	.25

Table 5 Percentage of each pain group reporting chronic diseases

	Pain Classification				
Number of Chronic Diseases	No Pain	Mild	Mild to Moderate	Moderate	Severe
0	48.1	21.3	10.2	8.3	4.2
1	27.7	27.1	23.4	20.7	17.7
2	13.3	25.2	26.5	20.6	22.2
3	6.2	11.7	14.5	15.4	17.1
4 or more	4.7	14.7	25.4	35.0	38.8

Table 6 Proportion reporting general activity limitations by pain group

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Activity Limitations	.10	.27	.53	.64	.85

Table 7 Proportion rated Inactive (sedentary) by pain group

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Proportion Inactive	.04	.11	.14	.16	.25

Table 8 Average disability days in the past two weeks by pain group

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Disability Days	.63	1.15	2.35	3.19	6.19

Health utilization by pain classification

In this section a number of health utilization variables measured by the NPHS are presented according to the pain classification previously presented. As was the case with Health Status variables, the fundamental finding is that all of these variables also show a gradation with levels of chronic pain.

Table 9 Proportion overnight (or longer) hospitalization in the past 12 months

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Proportion Hospitalized	.06	.08	.14	.16	.24

Table 10 Average consultations with a medical professional in past 12 months

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Consultations	3.43	5.79	8.90	9.93	13.42

Table 11 Proportion reporting an unmet health need

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Prop. Unmet Needs	.06	.14	.19	.25	.29

Table 12 Proportion consulting an alternative care provider

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Alternate care	.07	.11	.13	.17	.15

Table 13 Proportion attending a self-help group

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Self Help Group	.03	.04	.04	.08	.07

Table 14 Proportion reporting the use of pain relievers

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Pain Relievers	.67	.81	.86	.87	.88

Table 15 Proportion reporting use of narcotic medication

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Narcotics	.05	.10	.16	.18	.31

Table 16 Average number of medications reported

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Number of Medications	.79	1.23	1.80	2.03	2.85

Relationship to chronic diseases

The derived chronic pain classification was employed to examine the associations between chronic disease and chronic pain. There are a number of complications to this analysis:

1. The NPHS asked questions about only a selection of chronic diseases. Some of these are not generally associated with pain.
2. The NPHS allowed the individual to register all chronic diseases from which they suffered. This complicates analysis because a decision needs to be taken as to whether to ignore or attempt to model the effects of co-morbidity.

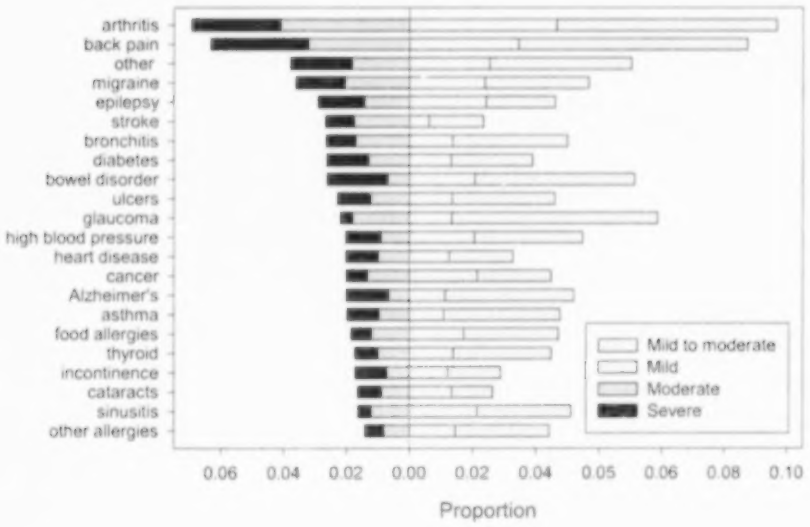
The current analysis attempted to control for (or model) the effects of co-morbidity, so that the resulting estimates of pain prevalence within the chronic diseases should be thought to refer to *individuals suffering from that single chronic disease alone.* The presence of two or more chronic diseases would increase the proportion of individuals suffering pain in every category.

The base analysis was a multinomial logistic regression in which each of the pain categories within the combined pain scale were predicted by the presence or absence of each of the 22 chronic disease categories queried by the NPHS. No interaction terms were entered[3].

The probabilities of belonging to each pain category in the presence of each single chronic disease were calculated. These were arrayed in a histogram in figure 5 below. Left of the centre line is a stacked histogram showing the proportion of the individuals self-identifying as suffering from a particular chronic disease who also report suffering severe or moderate pain on the derived scale. To the right are the proportions suffering mild or mild to moderate pain.

Chronic pain of a moderate to severe severity is most likely to be reported in arthritis, back pain, and migraine headache. Rates are approximately equal to each other for other chronic diseases.

Figure 5 Chronic pain in chronic diseases



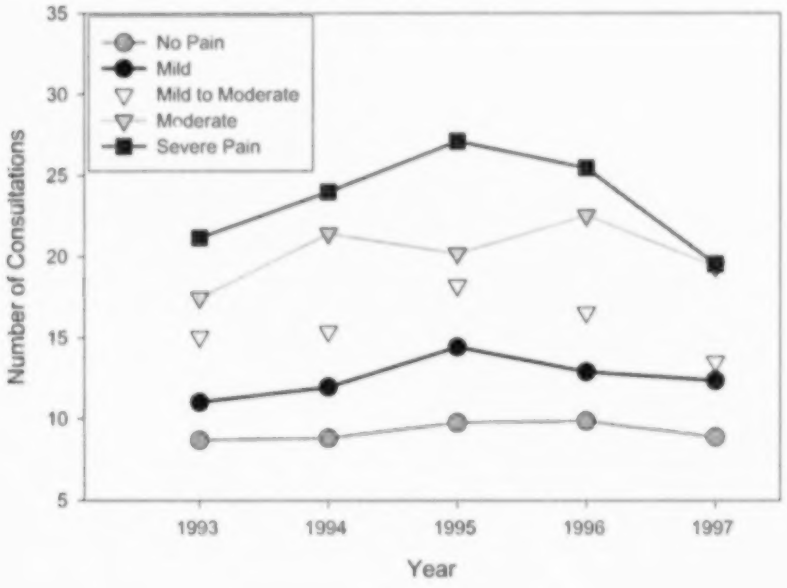
[3] It remains possible that suffering both disease A and disease B leads to a more considerable elevation of pain prevalence than implied by a non-interactive additive model in which the pain severities would be thought to sum.

Administrative records by pain classification

In this section, results are presented for the linkage between the NPHS and administrative records. Despite the fact that the number of individuals that could be linked for this analysis is only 39 per cent of the respondents, the picture presented by this data is consistent and compelling.

Figure 6 shows the average number of medical consultations from administrative records for each year from 1992 to 1997. It is interesting to note that these numbers appear to be substantially larger than those reported in the survey.

Figure 6 Consultations with health professionals by pain classification



Figures 7 and 8 show the number of hospitalizations and the total number of hospital days according to administrative records.

Figure 7 Number of hospitalizations by pain classification

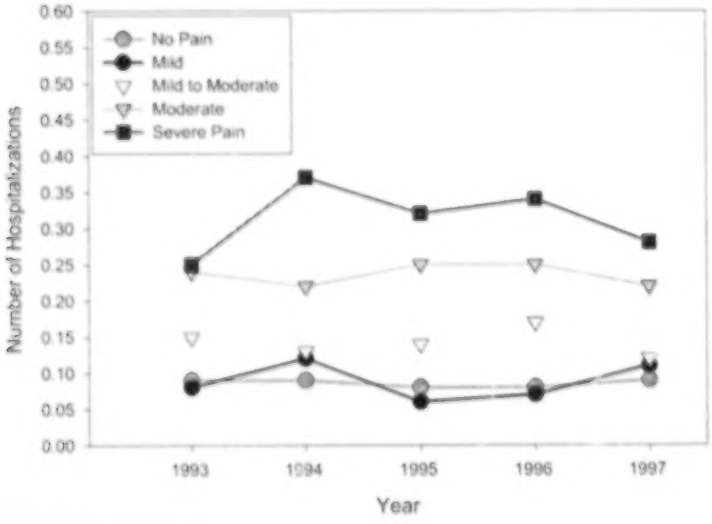
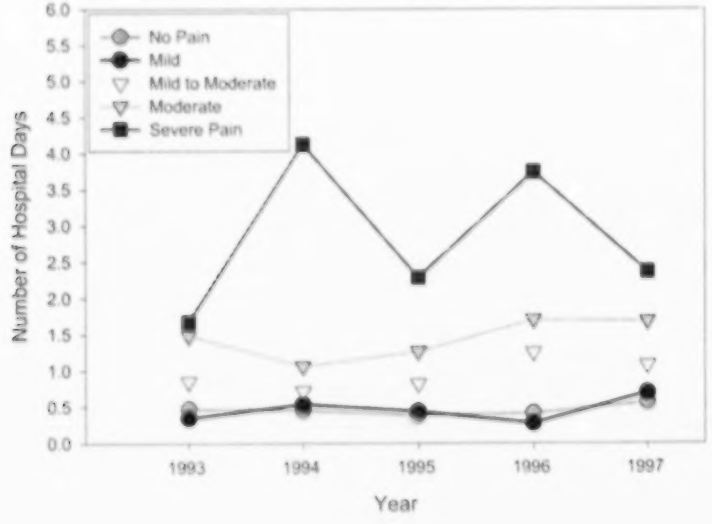


Figure 8 Number of hospital days by pain classification



In all cases, the gradation in health utilization is as expected: individuals with severe pain requiring greater levels of utilization than those with moderate levels of pain. In turn those with moderate pain utilized greater levels of health care services than did individuals with mild to moderate pain, and so on. As well, while 1996 (the year of the survey) generally had the highest levels of utilization, the levels in the three previous years and in the following year were only very slightly lower.

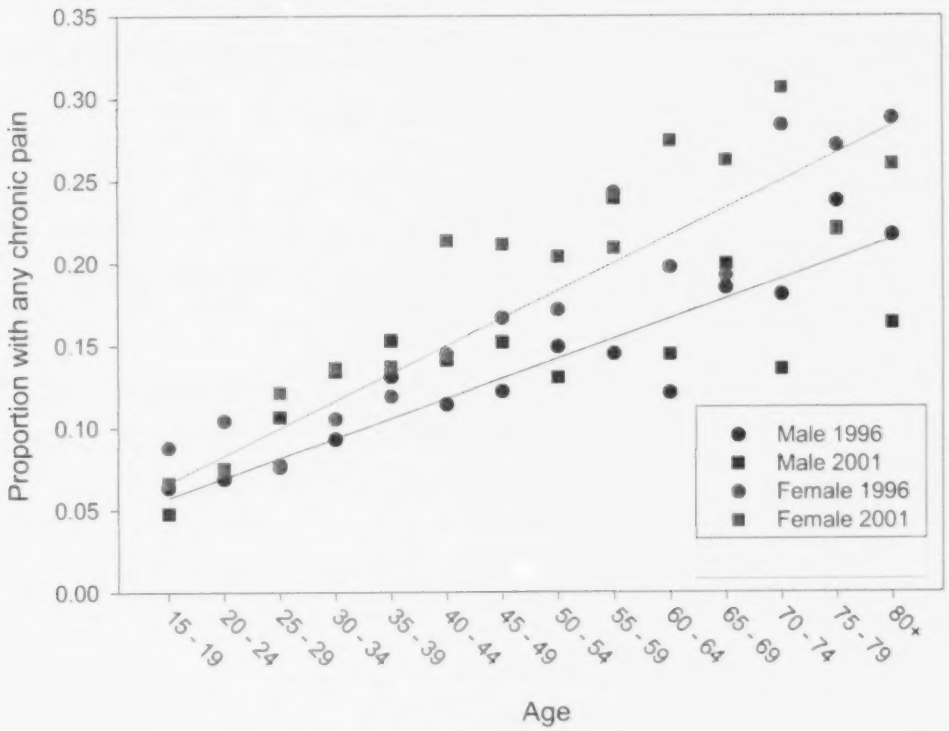
Stability of prevalence estimates for chronic pain

Data from the Canadian Community Health Survey (CCHS) recently became available from Statistics Canada. The CCHS is a major cross-sectional health survey first conducted by Statistics Canada in 2001. Over 130,000 Canadians were sampled with the intention of providing health indicators at a regional level for over 135 health regions across Canada. It is anticipated that the CCHS will be conducted with a similar sample size every two years. It replaces the NPHS for cross sectional purposes.

Although the CCHS contains fewer questions than the NPHS, the Health Utility Index was included for 2001. The chronic pain classification employed in the analysis of the NPHS data was calculated for the 13,725 subjects (aged 15 and over) to whom the CCHS was administered.

Age-sex specific prevalences for individuals over age 15 for both the 1996 NPHS and 2001 CCHS samples are shown figure 9. The figure also shows trend lines for each year and each sex.

Figure 9 Age-sex prevalence of chronic pain, NPHS 1996 and CCHS 2001

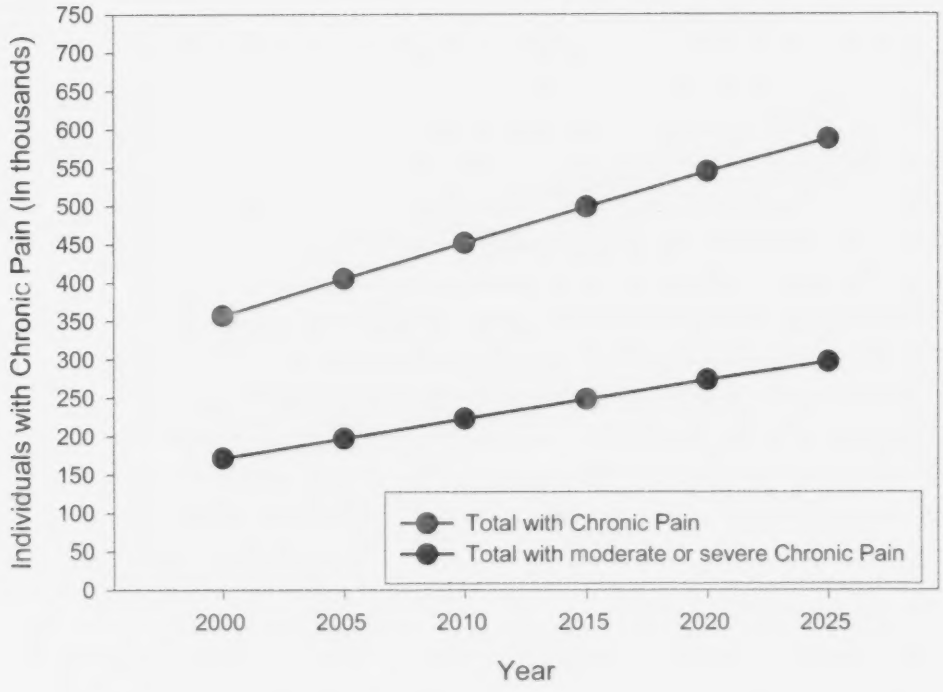


The data from the two surveys reveal a similar picture: female rates are higher and rise more rapidly with age. There is a slight but statistically significant increase in baseline chronic pain rates from 1996 to 2001, particularly for females. (This can be seen in the increased level of the 2001 trend lines). This apparent increase is also present for females, but not males, in the severe pain categories.

Prevalence projections for chronic pain

The age-sex prevalence rates calculated from the 2001 CCHS were applied to population projections previously prepared by Health Surveillance (Alberta Health and Wellness, 2000). The number of individuals 15 years of age and over projected to have chronic pain and moderate or severe chronic pain is shown in figure 10.

Figure 10 Expected change in number of individuals suffering chronic pain



It is apparent that there will be a large increase in the number of individuals suffering chronic pain in Alberta even in the absence of a change in the prevalence rates for chronic pain. In fact this increase will be about 70 per cent in the next 25 years. Part of the increase is due to a population increase in Alberta, but the primary impact will come from the aging of the population.

Conclusion

These data derived from the Alberta sample of the National Population Health Survey (NPHS) provide estimates of the prevalence and severity of chronic pain in Alberta. Two NPHS questions target pain intensity and interference with activity due to pain. The questions are very strongly correlated and allow the creation of a valid composite pain measure.

Rate of chronic pain

The estimated prevalence of severe chronic pain in the Alberta population based on this composite pain measure is 2.3 per cent. The estimate of the total prevalence of chronic pain, including those who are mildly or moderately effected along with severely effected individuals, is 11.2 per cent. Millar (1996) using data from the 1994 NPHS found a Canada-wide of 17 per cent prevalence for individuals aged 15 and over. The comparable figure for Alberta for the 1996 NPHS is 13.2 per cent for individuals aged 15 and over. The difference is very likely due to the fact that Alberta has a young population relative to the rest of Canada.

Chronic pain, age and income

In fact, the proportion of individuals in the pain categories of this measure increases in prevalence with age. This relationship is found in both males and females. The proportion of individuals in the pain categories of this measure also decreases as income increases.

Chronic pain and health status

A large number of health status and health utilization measures from the NPHS confirm that there is a gradient according to pain such that health status decreases and health utilization increases as pain levels increase.

Chronic pain and chronic diseases

Respondents to the NPHS also reported the presence of a number of chronic illnesses. Using regression analysis, the association of chronic pain with these illnesses was estimated. The results of these analyses indicate the highest proportion of severe and moderate chronic pain is associated with arthritis, back pain, and migraine headache.

Chronic Pain and utilization of health services

Utilization measures derived from record linkage confirm the gradient in health utilization measures, and show that the gradient exists for at least four years prior to the survey, and at least one year after the survey.

Changes in prevalence and number of chronic pain sufferers

The prevalence of chronic pain appears to have increased slightly from 1996 to 2001 as measured by the CCHS, particularly for females. The shape of the relationships with age remained the same.

Finally, the number of individuals suffering chronic pain will increase dramatically in Alberta over the coming decades due to the aging of the population, even if the prevalence of chronic pain does not change.

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